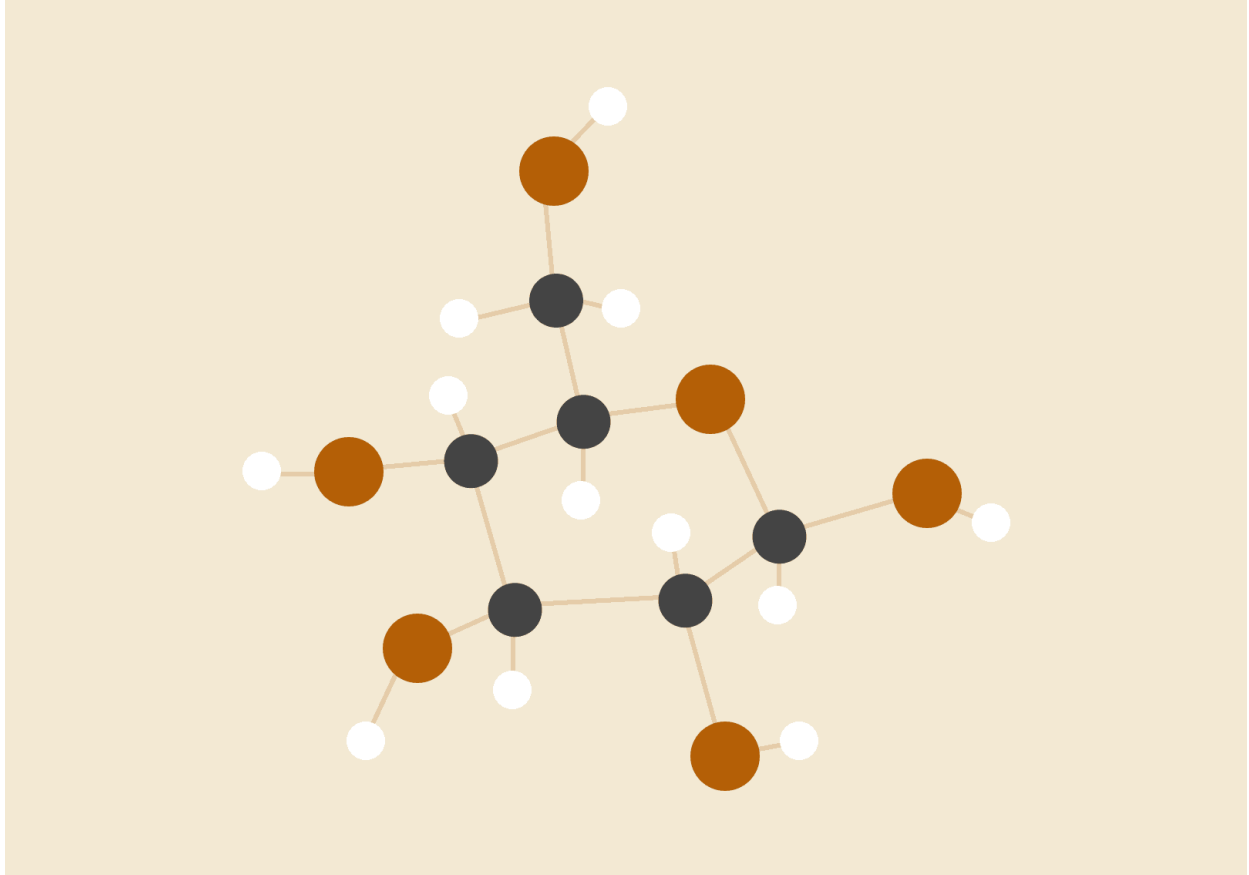


Black hole incinerator

A paper on theoretical concept to convert trash to energy with 100% energy



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09-07-2025

INTRODUCTION

The paper explores a theoretical idea to exploit black holes and Hawking radiation into making an incinerator with 100% matter to energy. Preferably using trash for the matter.

Idea

The idea is about trapping a black hole with a lifespan near a few minutes.

According to Hawking radiation, a black hole will lose its mass, radiation in the form of Hawking radiation. If we supply mass at the same rate of its Hawking radiation, the black hole could be theoretically sustained indefinitely. The radiation radiated can be captured and converted into electricity for our needs. The key is to not underfeed or overfeed the blackhole so it doesn't evaporate fully or go out of control respectively.

If such a system were made where we can control mini black holes and effectively handle the enormous Hawking radiation and successfully convert it to energy, it could indeed be a source of cleanest and cheapest energy for the world.

MATERIALS

1. Mini black hole
2. A box to contain
3. A Hawking radiation to usable electricity conversation system

Theoretical Calculations

Mass of the blackhole:

We will consider a static, non rotating black hole, with a Hawking life span of 1 minute for our rough calculation.

The mass of the black hole can be calculated by Hawking radiation equation:

$$t = (5120 \times \pi \times G^2 \times M^3) / (\hbar \times c^4)$$

Where:

M = mass of the black hole (in kg)

t = desired lifetime in seconds

$\hbar$ = reduced Planck constant $\approx 1.055 \times 10^{-34}$ J·s

c = speed of light $\approx 3.00 \times 10^8$ m/s

G = gravitational constant $\approx 6.674 \times 10^{-11}$ m³/kg·s²

We will rearrange to separate M

$$M = ((t \times \hbar \times c^4) / (5120 \times \pi \times G^2))^{(1/3)}$$

Putting our desired value for its life span t = 60s, we get

$$t = 60$$

$$\hbar = 1.055 \times 10^{-34}$$

$$c = 3.00 \times 10^8$$

$$G = 6.674 \times 10^{-11}$$

Numerator:

$$t \times \hbar \times c^4 = 60 \times (1.055 \times 10^{-34}) \times (3.00 \times 10^8)^4$$

$$= 60 \times 1.055 \times 8.1 \times 10^{33} \times 10^{-34}$$

$$= 60 \times 1.055 \times 8.1 \times 10^{-1}$$

$$= 60 \times 8.5455 \times 10^{-1}$$

$$\approx 512.73 \times 10^{-1}$$

$$\approx 51.273$$

Denominator:

$$5120 \times \pi \times G^2 = 5120 \times 3.1416 \times (6.674 \times 10^{-11})^2$$

$$= 5120 \times 3.1416 \times 4.454 \times 10^{-21}$$

$$\approx 5120 \times 3.1416 \times 4.454 \times 10^{-21}$$

$$\approx 5120 \times 13.989 \times 10^{-21}$$

$$\approx 71661 \times 10^{-21}$$

$$\approx 7.1661 \times 10^{-17}$$

$$M^3 = 51.273 / (7.1661 \times 10^{-17})$$

$$\approx 7.156 \times 10^{17}$$

$$M = (7.156 \times 10^{17})^{(1/3)}$$

$$\approx 8.88 \times 10^5 \text{ kg}$$

Therefore, the mass of the required black hole is approximately 8.88×10^5 kg.

Hawking radiation emitted per second:

Use Hawking radiation power formula:

$$P = (\hbar c^6) / (15360 \pi G^2 M^2)$$

Step 1:

$$c^6 = (3.00 \times 10^8)^6 = 7.29 \times 10^{48}$$

Step 2:

$$M^2 = (8.88 \times 10^5)^2 = 7.89 \times 10^{11}$$

Step 3:

$$G^2 = (6.674 \times 10^{-11})^2 = 4.454 \times 10^{-21}$$

Step 4:

$$\text{Denominator} = 15360 \times \pi \times G^2 \times M^2$$

$$= 15360 \times 3.1416 \times 4.454 \times 10^{-21} \times 7.89 \times 10^{11}$$

$$\approx 15360 \times 3.1416 \times 3.514 \times 10^{-9}$$

$$\approx 15360 \times 11.049 \times 10^{-9}$$

$$\approx 169690 \times 10^{-9}$$

$$\approx 1.697 \times 10^{-4}$$

Step 5:

$$\text{Numerator} = h \times c^6 = 1.055 \times 10^{-34} \times 7.29 \times 10^{48}$$

$$\approx 7.692 \times 10^{14}$$

Step 6:

$$P = \text{Numerator} / \text{Denominator}$$

$$= 7.692 \times 10^{14} / 1.697 \times 10^{-4}$$

$$\approx 4.533 \times 10^{18} \text{ watts}$$

Therefore, the black hole emits approximately 4.533×10^{18} watts. Too much to handle easily right now

Trash needed per hour:

Power output:

$$P = 4.53 \times 10^{18} \text{ watts} = 4.53 \times 10^{18} \text{ joules/second}$$

$$\text{Time} = 1 \text{ hour} = 3600 \text{ seconds}$$

Total energy in 1 hour:

$$E = P \times \text{time}$$

$$= 4.53 \times 10^{18} \times 3600$$

$$= 1.63 \times 10^{22} \text{ joules}$$

Now use:

$$E = m \times c^2 \Rightarrow m = E / c^2$$

$$c^2 = (3.00 \times 10^8)^2 = 9.00 \times 10^{16}$$

$$m = 1.63 \times 10^{22} / 9.00 \times 10^{16}$$

$$= 1.81 \times 10^5 \text{ kg}$$

Therefore, we need to feed 1.81×10^5 kg of trash per hour to maintain the black hole, about 51 kg per second, or a garbage truck every few minutes. Feed less, our incinerator dries up, feed more, than whole earth become it's dinner

DATA

Mass of blackhole	$8.88 \times 10^5 \text{ kg}$
Hawking radiation emitted	$4.533 \times 10^{18} \text{ watts}$
Trash per hour	$1.81 \times 10^5 \text{ kg}$

Challenges

First off, making a blackhole, even a little one, controlling it, especially using it as an incinerator is a thing for the far future. For me, it seems like sci-fi technology.

First of all, we don't know how to make and control a black hole.

Second, even if we did achieve to control a black hole somehow with sorcery, the Hawking radiation it emits is enormous, handling it is a gigantic task of its own.

Last but not the least, a steady supply of trash is very mandatory, at first it seems like a

non issue, but at this rate, our whole country will be shining and we will be facing trash scarcity. Though this is a very much relatively solvable issue, if we make it this far.

CONCLUSION

I just thought of it, so I wrote it so when someone does discover this from the grave of an internet archive, it might be a fun time reading a brilliant but bold concept.

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Written in India, year 2025.